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HUXLEY AS A MUTATIONIST

ELSEWHERE I have pointed out that Galton¹ held with equal firmness to continuity and discontinuity in variation, and that the American horticulturist and botanist, Thomas Meehan,² held clear mutationist conceptions which he supported by accurate observations of variations in many plants. It seems worth while to add a note on the attitude of Huxley with regard to this question.

Whenever Huxley expressed himself on this matter he usually took occasion to say explicitly that he could see no reason why variations should not be discontinuous as well as continuous, and one of the few points on which he differed from Darwin was in ascribing greater significance to such marked changes. Several statements of his position in this matter are found in his volume of essays entitled *Darwiniana*.

Thus he says (p. 77) :

Mr. Darwin's position might, we think, have been even stronger than it is if he had not embarrassed himself with the aphorism "*natura non facit saltum*," which turns up so often in his pages. We believe, as we have said above, that Nature does make jumps now and then, and a recognition of the fact is of no small importance in disposing of many minor objections to the doctrine of transmutation.

Elsewhere (pp. 34, 404) Huxley refers to the well-known Ancon sheep, which originated from a single ram in the flock of a Massachusetts farmer named Seth Wight. The story of this breed of sheep is told in a letter from Col. David Humphreys to Sir Joseph Banks, then President of the Royal Society.³ The farmer kept a flock of 15 ewes and one ram on the banks of the Charles River, at Dover, Mass., 16 miles from Boston. In 1791 a ram

¹ "Galton and Discontinuity in Variation," *AMER. NAT.*, 48: 697-699, 1914.

² "An Anticipatory Mutationist," *AMER. NAT.*, 49: 645-648, 1915.

³ Humphreys, D., 1813, "On a New Variety in the Breeds of Sheep," *Phil. Trans. Roy. Soc.*, 1813: 88-95.

lamb was born having a short length of back and short bandy legs. Seeing an advantage in such an animal owing to its inability to jump fences, it was bred to the flock, the original ram being killed. The first year thereafter two lambs had the peculiarities of their father, and in following years a number more Ancon lambs were produced. The latter when bred together always, with one questionable exception, produced Ancons.

Hence the character was evidently a recessive, having originated from the normal through a negative variation or mutation, presumably in one germ cell. This being the case, the variation must have been carried in a latent or recessive condition for a certain number of generations until inbreeding brought it out in a homozygous form. The original ram which was killed must have been heterozygous for this character, also one at least of the ewes and probably more; for one such heterozygous ewe was necessary to produce the original Ancon ram, and the two Ancons which appeared next year in the back-cross not improbably came from different mothers. It is therefore impossible to say just how long this condition may have been handed on in a "latent" condition before inbreeding brought it out.

With few exceptions, the Ancons showed alternative inheritance when crossed with normal sheep, and (l. c., p. 90).

Frequent instances have happened where common ewes have had twins by Ancon rams, when one exhibited the complete marks of features of the ewe; the other of the ram.

Incidentally this shows that such twins came from separate ova.

In a flock the Ancon sheep tended to keep together and separate from the normal members of the flock. The breed seems to have attained some popularity, but their flabby subscapular muscles, infirm construction, loose joints, crooked forelegs and awkward gait, while preventing them from jumping fences made them difficult to drive to market. Butchers also found the carcasses smaller and less saleable, so that they were soon supplanted after the introduction of the Merino. They were already scarce in 1813 and afterwards became extinct.

Huxley remarks regarding this case:

Varieties then arise we know not why; and it is more than probable that the majority of varieties have arisen in this "spontaneous" manner, though we are, of course, far from denying that they may be traced, in some cases, to distinct external influences. . . . But however they may have arisen, what especially interests us at present is, to remark

that, once in existence, many varieties obey the fundamental law of reproduction that like tends to produce like; and their offspring exemplify it by tending to exhibit the same deviation from the parental stock as themselves.

After further discussing the case, Huxley remarks (*Op. cit.* p. 39) :

Here, then, is a remarkable and well-established instance, not only of a very distinct race being established *per saltum*, but of that race breeding "true" at once, and showing no mixed forms, even when crossed with another breed.

Réaumur's case of a Maltese couple having a hexadactylous son, three of whose four children were again hexadactylous, also comes in for Huxley's comment (p. 35 ff.). The following dicta on the subject of variation, from the same volume, are also worth quoting :

Indeed we have always thought that Mr. Darwin unnecessarily hampered himself by adhering so strictly to his favourite "Nature non facit saltum." We greatly suspect that she does make considerable jumps in the way of variation now and then, and that these saltations give rise to some of the gaps which appear to exist in the series of known forms (p. 97).

I apprehend that the foundation of the theory of natural selection is the fact that living bodies tend incessantly to vary. This variation is neither indefinite, nor fortuitous, nor does it take place in all directions, in the strict sense of these words. . . . A whale does not tend to vary in the direction of producing feathers, nor a bird in the direction of developing whalebone (p. 181).

The importance of natural selection will not be impaired even if further inquiries should prove that variability is definite, and is determined in certain directions rather than in others, by conditions inherent in that which varies. It is quite conceivable that every species tends to produce varieties of a limited number and kind, and that the effect of natural selection is to favour the development of some of these, while it opposes the development of others along their predetermined lines of modification (p. 223).

From these and similar statements it appears evident that were Huxley living to-day he could scarcely escape being classed as a mutationist.

R. RUGGLES GATES

UNIVERSITY OF CALIFORNIA